

AMENDMENTS TO THE CLAIMS

Claims 1 and 3-11, and 13-22, and 24-30 have been amended, and claims 2, 12, and 23 have been cancelled. A listing of the claims follows and replaces all prior listing of the claims.

LISTING OF THE CLAIMS

Claim 1 (Currently amended): Polymer composite blended mixture including a compatibilizer and having selective permeability to chemical permeants due to interaction differences between the compatibilizer and the chemical permeants, the polymer composite comprising:

50-99 wt % of an amorphous (or low crystalline) thermoplastic resin as a matrix resin selected from the group consisting of polyethylenepropylendienterpolymer, poly(1-(trimethylsilyl)-1-propyne),-amorphous nylon, polystyrene and polycarbonate;

0.9-50 wt % of a semi-crystalline polymer selected from the group consisting of polyamide (nylons), polyethylene terephthalate, polybutylene terephthalate, polyethylene, polypropylene, polyetheretherketone, polyvinylidene fluoride, polytetrafluoroethylene, polyphenylene sulfide, and thermotropic liquid crystal polymer, and or lyotropic liquid crystal polymer, and dispersed in the amorphous thermoplastic resin to provide a dispersed phase having an interface with the amorphous thermoplastic resin; and

0.1-10 wt % of a compatibilizer consisting of a block copolymer or a graft copolymer having compatibility or compatibility generated generated by interfacial reaction, being selected from the group consisting of poly(styrene-co-maleic anhydride), random or block copolymer of styrene and maleic, polystyrene whose oxazoline group is substituted, amorphous polymer added with a maleic anhydride group, polycarbonate having a reaction group, and polystyrene having a reaction group, and positioned at the interface of the dispersed phase with the amorphous thermoplastic resin, and having different interactions with different chemical permeants so that the selective permeability of the polymer composite is affected.

Claim 2 (Cancelled).

Claim 3 (Currently amended): ~~The polymer composite~~ Polymer-blended mixture according to the claim 1 or 2, ~~wherein the amount of the amorphous thermoplastic resin is present in an amount of 75-95 wt %, the amount of the semi-crystalline polymer is present in an amount of 4.9-25 wt %, and the amount of the compatibilizer is present in an amount of 0.1-5 wt %.~~

Claim 4 (Currently amended): ~~The polymer composite~~ Polymer-blended mixture according to the claim 1 or 2, wherein the semi-crystalline polymer has low gas permeability irrespective of degree of crystallinity and is selected from the group consisting of polyamide (nylons), polyethylene terephthalate, polyethylene, polypropylene, polyetheretherketone, polyvinylidene fluoride, polytetrafluoroethylene, polyphenylene sulfide, ~~and thermotropic liquid crystal polymer, and [[or]] lyotropic liquid crystal polymer.~~

Claim 5 (Currently amended): ~~The polymer composite~~ Polymer-blended mixture according to the claim 1 or 2, wherein the compatibilizer is positioned at the interface between the ~~amorphous~~ thermoplastic resin and the semi-crystalline polymer~~[[.]] to lower [[an]] interfacial tension there between the semi-crystalline polymer and the thermoplastic resin, so that improves the dispersion is improved, and strengthens the interfacial adhesion is strengthened, and interaction with as well as interacts differently for different diffusing gas molecules, hence, changes the varies to vary respective gas diffusion rates of each gas.~~

Claim 6 (Withdrawn and currently amended): A method for preparing a film from the polymer ~~composite~~ blended mixture claimed in claim 1, ~~[[or 2]]~~ comprising the step of:

- a. forming a melt blend by mixing the ~~theremoplastic thermoplastic~~ resin, the semi-crystalline polymer and the compatibilizer; and
- b. axially drawing the melt blend obtained from step (a) using an extension apparatus or film blowing apparatus connected to an extrusion die to fabricate a film,

wherein ~~a phase of the semi-crystalline polymer has~~ a phase having a stripe shape in the

film due to non-equal biaxial drawing, ~~so that the film has greater~~ which means more extension in the vertical direction than in the horizontal direction.

Claim 7 (Withdrawn): A film prepared by the method claimed in claim 6.

Claim 8 (Withdrawn and currently amended): ~~The~~ [[A]] method according to claim 6, wherein ~~the extrusion die has a~~ dual mandrel of which inside and outside are rotated in the opposite directions ~~is used as the extrusion die~~, so that a morphologically modified semi-crystalline phase is formed in a net shape.

Claim 9 (Withdrawn): A film prepared by the method claimed in claim 8.

Claim 10 (Withdrawn and currently amended): ~~The~~ [[A]] method according to claim 6, ~~wherein the extrusion die is a multiple coextrusion die, and wherein the film is a~~ multilayer film composed of many layer ~~a plurality of layers that~~ is fabricated by using [[a]] ~~the~~ multiple coextrusion die.

Claim 11 (Withdrawn and currently amended): A film prepared by the method claimed in claim 10.

Claim 12 (Cancelled).

Claim 13 (Withdrawn and currently amended): A gas separation method ~~using the, comprising:~~
~~providing a~~ gas separation membrane ~~comprised of the polymer composite~~ of the claim 1
[[12]]; and
~~using the gas separation membrane to separate gases.~~

Claim 14 (Currently amended): ~~The polymer composite~~ Polymer-blended mixture according to the claim 1 ~~or 2, wherein the~~ amorphous crystalline polymer of the matrix resin has a ~~high~~ higher melting point than that of ~~the~~ semi-crystalline polymer at the processing temperature.

Claim 15 (Currently amended): An oriented film prepared from the polymer composite blended mixture of the claim 14.

Claim 16 (Withdrawn and currently amended): Gas separation method, process using comprising:

providing the oriented film of the claim 15; and

using the oriented film as a gas separation separation membrane.

Claim 17 (Currently amended): The polymer composite ~~Polymer-blended mixture~~ according to the claim 1 or 2, wherein the semi-crystalline polymer consists of one ingredient or one or more ingredients of said semi-crystalline polymer selected from the group consisting of polyamide (nylons), polyethylene terephthalate, polybutylene terephthalate, polyethylene, polypropylene, polyetheretherketone, polyvinylidene fluoride, polytetrafluoroethylene, polyphenylene sulfide, thermotropic liquid crystal polymer, and lyotropic liquid crystal polymer.

Claim 18 (Currently amended): A thin film that is a one ~~One-layer thin film~~ or a multilayer thin film which is prepared from comprising the polymer composite blended mixture of the claim 17.

Claim 19 (Withdrawn and currently amended): A method of preparing the thin film of the claim 18, comprising the step of:

a. forming a melt blend by mixing the ~~theremoplastic~~ thermoplastic resin, the semi-crystalline polymer and the compatibilizer; and

b. axially drawing the melt blend obtained from step (a) using an extension apparatus or film blowing apparatus connected to an extrusion die to fabricate a film,

wherein ~~a phase~~ of the semi-crystalline polymer has a phase having a stripe shape in the film due to non-equal biaxial drawing, so that the film has greater ~~which means more~~ extension in the vertical direction than in the horizontal direction.

Claim 20 (Withdrawn and currently amended): ~~The~~ [[A]] method according to the claim 19, wherein ~~the extrusion die has a~~ dual mandrel of which inside and outside are rotated in the opposite directions ~~is used as the extrusion die~~, so that a morphologically modified semi-crystalline phase is formed in a net shape.

Claim 21 (Currently amended): ~~The polymer composite~~ Polymer-blended mixture according to the claim 17, ~~wherein the~~ amorphous crystalline polymer of the matrix resin has a ~~high~~ higher melting point than that of ~~the~~ semi-crystalline polymer at the processing temperature.

Claim 22 (Currently amended): An oriented film prepared by the method of claim 19 ~~[[17]]~~.

Claim 23 (Cancelled).

Claim 24 (Withdrawn and currently amended): Gas separation method ~~process~~ using, comprising:

providing the oriented film of the claim ~~[[23]]~~ 22; and
using the oriented film as a gas separation ~~separation~~ membrane by passing gases
through the oriented film to cause separation of the gases.

Claim 25 (Currently amended): A polymer composite film for gas ~~separation~~, ~~separation~~ wherein the semi-crystalline polymer of claim 1 ~~or 2~~ has a thickness in nanometers ~~of nanometer~~.

Claim 26 (Currently amended): A film according to claim 7 or 15, wherein the dispersed phase is composed of at least one inorganic material ~~materials (such as clay)~~ and the film includes a compatibilizer for the matrix resin and the dispersed phase.

Claim 27 (Withdrawn and currently amended): Gas separation method ~~process~~ using, comprising:

providing the film of the claim 26; and

using the film as a gas separation separation membrane by passing gases through the film to cause separation of the gases.

Claim 28 (Currently amended): The polymer composite ~~Polymer-blended mixture~~ according to claims 1[[, 2]] or 3, wherein the compatibilizer is positioned at the interface by reaction ~~reactiong~~ with the matrix resin or the dispersed phase to form a copolymer.

Claim 29 (Withdrawn and currently amended): A ~~semi-crystalline~~ polymer composite ~~blended-gas separation separation~~ membrane according to the claim 1 [[12]], wherein the compatibilizer is positioned at the interface by ~~reactiong~~ reaction with the matrix resin or the dispersed phase to form a copolymer.

Claim 30 (Currently amended): A film according to claim 22 [[21]] or 26, wherein, when in case the matrix resin is PPO(poly(2,6-dimethyl-1,4-phenylene oxide) and the dispersed phase is polyamides, the compatibilizer is a random copolymer or a block copolymer of styrene and maleic anhydride ~~is used~~.